

Appl. No. : 10/716,910
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IN THE SPECIFICATION:

Please amend the specification as follows:

[0010] These and other features, aspects and advantages of the present invention are described below with reference to the drawings of several preferred embodiments, which are intended to illustrate and not to limit the invention. The drawings comprise eleven figures~~ten figures~~.

[0101] Because the top end of the camshaft cover member 179 is nested in the sprocket 188 in the arrangement, the illustrated sprocket 188 should be disassembled from the camshaft 172 before the cover member 179 is removed. Similarly, in this situation, the wrench inserted through the slot 574 to prevent the camshaft from rotating. The ~~repair person~~repair person thus can work easily without the need for a special tool for preventing the timing chain or belt from moving or preventing the vanes of the VVT 240 from rotating. Accordingly, the amount of labor needed can be reduced.

[0122] The ACAPC unit 384 preferably receives the actual camshaft angular position signal from the camshaft angle position sensor 350 and the crankshaft angular position signal, which gives two possible ranges of camshaft angular position, from the crankshaft angle position sensor 352. The ACAPC unit 384 then calculates a deviation value which indicates how much the actual camshaft angular position deviates within the two possible ranges of camshaft angular position. The engine speed calculation unit 386 receives the crankshaft angular position signal from the crankshaft angle position sensor 352 and calculates an engine speed using the signal versus time. In the illustrated ECU 201 arrangement, the signal from the ACAPC unit 384 and engine speed calculation unit 386 ~~may used~~may be used by the operational condition unit 380 to determine the operational condition of the engine 32 and/or watercraft 30.

[0128] FIGURE 6(a) is an example of a control map that may be used by the ECU 201 to control valve timing. FIGURE 6(a) illustrates engine torque for various engine ~~spend~~speeds as a function of the timing of the closing of the intake valve 134 (i.e., the angle after bottom dead center at which the intake valve 134 closes). As shown, for each engine speed (e.g., 3000 rpm, 4500 rpm and 6000 rpm) there exists an optimum intake valve closing time at which engine torque is maximized. In comparison, the dashed lines in FIGURE 6(a) illustrate the torque achieved for each engine speed if the intake valve closing time is fixed. As a result, as shown in FIGURE 6(b), by utilizing the VVT

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mechanism 240 and the control system described above to control intake valve closing timing, the torque of the engine can be improved over a range of engine speeds as compared to an engine that does not utilize variable valve timing.

[0132] In a preferred embodiment, the cruising operation control unit 396 utilizes signals of at least the throttle position sensor 354, the shift operation detection device 368, the shift position detection ~~device 36~~device 366, camshaft angle position sensor 350, and/or the crankshaft angle position sensor 352 and data from operational condition unit 380 to determine if the engine is in a cruising mode and to adjust the timing of the intake valve 134 in response to load fluctuations. The ECU 201 may also include a throttle operation device 394, which receives signals from the throttle position sensor 354 and is configured to indicate when the throttle is being operated. In such an embodiment, in advancing or reversing operation of the watercraft, the cruising operation control unit 396 may issue a start command that indicates that the cruising engine speed is to be maintained. This decision may be based on the signal from a throttle operation device 394 indicating that the shift lever 402 is in a fixed position and from the engine speed calculation unit 386 indicating that the engine speed is being maintained at or near a steady state